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• EDITORIAL •

The Industrial Accountant in the Battle of Industry

There are many problems in business to-day which constitute a tremendous challenge to the ability and resourcefulness of the Industrial Accountant; but of the many, there is one which is predominant at the present time. Industry is in the very awkward position of being subject to tremendous pressure by the demands of organized labour on one hand and the restrictive Government Price Control on the other. Some have referred to this situation as the "battle of industry" although, strictly speaking, industry is the unfortunate party caught between the over aggressiveness of trade unions in their desire to secure higher wages for their members and the determination of the Government in its price control to the employees in wages, providing he is able to sell his product at a price which will permit him to recover his full cost of operating the business plus a margin of profit. This is, of course, inflation from which no one reaps any benefit except, possibly, the speculator. Such a policy would, of course, place management in a very precarious position since there would always be prevalent the fear of being caught with heavy inventories priced at an abnormally high value. It would indeed create a situation similar to that which existed after World War I. While everyone would like to see the end of Price Control, yet we must pay tribute to the Government in its Price Control policy, and it is far better that they be too cautious rather than too hasty and risk having a repetition of the conditions which prevailed in 1921. Since it is generally agreed that full production is the ultimate answer to the problem of Price Control, it would appear then that the problem is to reach full production with as little price rise as possible until the law of supply and demand can take effect.

It is not suggested that the industrial accountant can accomplish this any more than anyone else but the industrial accountant can contribute towards industrial peace, in cooperation with representatives of other departments in the business. The fact remains that a business has only one justification for its existence and that is, to make money. It used to be that there were only two parties interested in the financial outcome of a business enterprise, namely, the government and the shareholder, but to-day we have a third—labour. Before we can have industrial peace, the requirements of these three parties must be reconciled.

Since it is the duty of the Accountant to translate the operations of a business into dollars and cents, then it naturally follows that he should be able to contribute something to a common understanding between these three parties. Now it is true that labour's interest in financial reports is

a psychological one. In other words, employees want to make sure that they are not being exploited to provide greater profits for the benefit of the shareholders. Therefore, it is not always desirable, nor is it advisable, to submit financial reports to employees in the form of dollars and cents, but rather they should be submitted in draft form. It does not mean very much to tell the employees that the sales of a company were two million dollars, that expenses were one million, nine hundred and fifty thousand dollars, and the net profit was fifty thousand dollars; the employee cannot be expected to have a true sense of proportion when reading these statements, even if he could understand what the figures all meant. In fact, he is likely to be interested only in one figure, and this is, reported net profit, which to him may look to be pretty large, and a true justification for demanding higher wages. On the other hand, it would be much more satisfactory to submit a financial report to the employees in which it is shown that of one dollar of sales, so much was paid to employees for wages, so much was paid to the municipal and federal governments for taxes, so much was paid to suppliers for material, and so much was paid for repairs and maintenance. From the one dollar sale, so much was retained in the business to pay off outstanding debts, to replace worn-out equipment, and so much set aside as a surplus for a rainy day.

Even such a simplified report is not enough—there is still an educational job to be done. It must be explained that the business must produce a sufficient profit to provide some return to the shareholder on his investment, and so much must be retained in the business to build up a surplus. These two facts are essential to the stability of the business and the employee's job can be stable as long as the business can be stable. It is to be expected that the trade unions might be suspicious of the figures which are presented to them by the Company, therefore, they should be encouraged to employ a reputable auditor who should be given the opportunity to verify the accuracy of a report submitted. While finances do not constitute the whole cause for labour disputes, it can generally be found to be the basis for their argument.

On the other side of the picture, the Industrial Accountant can also perform an outstanding service by representing the interests of labour to management and the stock holders. There are two factors which can contribute a great deal towards employer-employee relationships—an interest on the part of the employee in the operations of the business, and a feeling of security. As to the first factor mentioned, profit-sharing is not suggested, for a careful analysis of the various aspects of any system of profit-sharing will disclose a number of very undesirable possibilities.

Employee interest in the operations of a business can be reached through the judicious use of a system of wage incentives based on either individual or collective effort. While there are many who will say that wage incentives will not be countenanced by labour unions, it must be remembered that in many industries labour unions have supported and, in fact, been a part of, the installation of wage incentives. The fact cannot be denied that wage incentives have been abused in many instances by management in the past, and it is only natural to expect considerable objection

on the part of labour unions to the adoption of any form of wage incentives. Notwithstanding, the Industrial Accountant may well consider advising some form of wage incentive plan by which not only productive labour participates but also indirect labour, including supervision. In this way the employees will have a definite interest in the operatons of the business and they can increase their earnings on the only basis which is sound—and that is, improved efficiency.

The Industrial Accountant might give serious thought to proposing a pension plan, suggesting health insurance, study the possibilities of guaranteed employment, and might even consider a guaranteed annual wage. These plans are all possible, and are in operation successfully in many Companies. In short, every consideration should be given to promote the interest of the worker and give him a feeling of security.

There are many who will say that such problems are beyond the scope of the Industrial Accountant, and that there are men who have been trained especially for industrial relations work. That is quite true, but it should be remembered that Financial Reports prepared by the Industrial Accountant are not in themselves the end, but the means to an end, which in this case is more intimate understanding between management and labour in producing goods which will sell at a profit within the price ceiling. The Industrial Accountant of the past can be severely criticized because he has, for the most part, felt that his duty concluded with the preparation of Financial Statements, he did not attempt to pick out of those Financial Statements, the wealth of information contained in them—information which could be used for every phase of business management.

To-Day's Challenge to Industry

In this issue we publish the first of a series of six articles written especially for "Cost & Management" by Mr. Harold Riley, Partner, Engineering & Management Services Ltd. In his first article entitled "To-day's Challenge to Industry", Mr. Riley explains some of the many problems in industry to-day and in the subsequent articles, he will endeavour to explain how best industrial and cost accountants and management can cope with those problems under the following headings:

Budgeting with special reference to the Variable Budget
Inventory Control and Production Control
Control of Labour and Overhead
Wage and Salary Admiistration (including Job Evaluation and Incentives)
Industrial Relations.

This series of articles has been especially designed to assist industrial and cost accountants in providing the tools for the most efficient control of business operations in preparation for the competitive economy which is so rapidly closing in upon us. These articles are also intended to inform management in the use of these controls.

Letter to The Editor

Editor,
Cost and Management,

Dear Sir:

During the period now extending over several months during which I have been receiving your magazine I have been an interested reader of your editorials. In connection therewith I have some remarks to make and trust you will bear with me while I make them.

As I have read it has been increasingly impressed upon me that your views are extremely orthodox. Now it is not my intention to say whether this is a virtue or a vice, but I do think it means that they require critical examination at our hands, in these days of failure of orthodoxy to prove itself, in the crucible of experience.

For instance, your statement in November issue that: "If the people at large understood even the most elementary principles, etc. . . . the violent periods of inflation and depression would never occur."

Can we accept this as a fundamentally true statement? I doubt it. It is a principle of logical reasoning that no conclusion can be more sound than the assumptions upon which it rests. Thus Euclid is as sound as Euclid's postulates and axioms; and from there we go to Einstein's conception of relativity, which includes curved space, an idea not within Euclid's thought, even the least little bit.

The individual must pursue his own economic interests as seen through his eyes and through his localized logic. But are we entitled to assume that a conclusion sound from that limited point of view, applies equally to the environment of the whole, in which we all live to-day and are integrated with?

We are not entitled to do anything of the sort; but we do it every day, and not only you and I, but our leaders in general.

Hence all our major decisions are at fault, with the results we see, but are unable to attribute to their true source.

Your faithfully,

A. BROWN.
Lethbridge Chapter.

POSITION WANTED

Accountant, with over ten years' General Accounting Experience and some Cost Work, seeks position as Accountant or Accountant-Office Manager, preferably in Hamilton or vicinity. Married, 32, now employed. For further information write Box No. 5.

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S. Nadorozny, Canadian Vocational Training.
Wm. A. Freeborn, Brantford Coach & Body Ltd., Brantford.
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Edward J. Winters, Vail's Cleaners Ltd.

St. Maurice Valley

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Jas. B. Briggs, Consolidated Paper Corp., Grand'mere, Que.
M. H. Dallaire, Shawinigan Chemicals Ltd., Shawinigan Falls, Que.
L. A. Garceau, Consolidated Paper Corp., Ltd., Grand'mere, Que.
C. A. R. Lambert, LaCie de Pub. "Du Nouvelliste" Ltd., Three Rivers.
Lucien Lambert, 68 Fifth Street, Shawinigan Falls.

NEW MEMBERS

Toronto

Robert C. Wills, Canadian Kodak Co. Ltd.

Vancouver

Eugene E. Dubeau, Bob Bodie Ltd.

Wm. H. Harvey, 2047 West 47th Avenue.

Windsor

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INCENTIVES

We will be pleased to send you on request a copy of our pamphlet on this subject.

ENGINEERING & MANAGEMENT SERVICES LIMITED
67 YONGE STREET TORONTO, CANADA

Chapter Notes

BAY OF QUINTE

One of the most interesting talks of the year was given to the chapter by Mr. Gordon Friesen, Kitchener, formerly of this city. From the introduction it was learned that Mr. Friesen had served with the R.C.A.F. and in the latter days of the war was loaned to the British Government and sent to Germany in April 1945 where he served in the capacity of Military Governor in a British Zone. The speaker outlined the plan that was inaugurated in their attempt to help and reform "displaced persons."

Very few of us realized how thoroughly the Nazi regime had totalitarized the German people and the importance of complete denazification. Mr. Friesen expressed his belief that the that most efficient way to avert war is to be prepared for it, and at all times an international army should be maintained in strong force. The speaker was introduced by Bert Houston and the thanks and appreciation of the club was expressed by Don LaFrance.

CALGARY

The last regular meeting of the Calgary Chapter for the year 1946 was held on December 11 in the Avenue Grill and took the form of a social evening. Roger Flumerfelt led some community singing and gave a short skit and H. K. "Pat" Williams showed two films on safety driving. There were about 40 in attendance and all seemed to have had a very enjoyable evening.

The Calgary Chapter takes this opportunity to extend seasons greetings to all members of the Society in Canada with the hope that the year 1947 will bring greater expansion and success to the Canadian Society as well as to the individual chapters than that experienced in the past.

FORT WILLIAM-PORT ARTHUR

The Port Arthur Country Club was the setting for the annual Christmas meeting held December 10th. After a very enjoyable dinner at which thirty members were present, we were privileged to be entertained by Bob Piper's sound movies.

We were honoured to have as guests Mr. J. H. McLellan and Mr. B. Pow of the Brompton Pulp and Paper Co. at Red Rock and Nipigon.

KITCHENER

The importance of the personnel department in manufacturing concerns and other businesses was stressed by W. E. Currie, industrial relations officer of the Dominion Electro Home Industries Ltd., Kitchener, at a meeting of Kitchener Chapter, held at the Walper House, Kitchener. Chairman Mel Walker presided.

Sixty members and guests from the district were in attendance including a large number of superintendents and works managers. They heard Mr. Currie outline the various phases of personnel work which has taken on increased importance during and since the war. He touched on hiring, work-

ing conditions, employees' securities, health and hospitalization groups, foreman training, in his talk entitled, "Labor Problems of Today."

The guest speaker was introduced by L. B. Hope of Kitchener and a vote of thanks given by Norman Hagen of Preston.

Mr. Currie spoke in the place of Allan Cameron of Galt Metal Industries Ltd., who was unable to be present.

OTTAWA

The regular monthly dinner meeting for December was held in the staff cafeteria of the E. B. Eddy Company in Hull, Quebec, on Thursday, December 12th.

This being the Christmas Meeting there was very little business undertaken. It was the expressed wish of the chapter directors that all those present mix freely and get to know each other.

Mr. W. Henderson provided films, one a technicolor film illustrating the four seasons in the Gatineau Valley, and the other a movie sing song.

Mr. R. W. Mitchell gave a short paper on the topic "Forms" which was a cleverly delivered comical satire on the many impractical uses of paper forms.

That well known character "Jean Baptiste" appeared and provided a half hour of hilarious laughter with his stories and songs to complete the organized entertainment.

Following the entertainment programme those present played table tennis, or cards, or stayed on for an hour or so to chat and get acquainted.

ST. MAURICE VALLEY

Members of the St. Maurice Valley Chapter of the Cost & Management Institute heard an interesting address on "Personnel Problems in Indusery" at their December meeting.

Mr. George Walsh, Personnel Manager of the Canada Car and Foundry Company, the guest speaker related the many aspects of labour-management problems. He was introduced by Eric Winsborrow, Vice-President of Shawinigan Foundries Ltd. and thanked by Jacques Gagnon, Personnel Manager of the Aluminum Company of Canada.

Mr. Henry Pike, Chairman of the Chapter, presided.

TORONTO

The December meeting of this Chapter took the form of a plant visit to Lever Bros. Ltd., on Wednesday, December 11th. The total of 124 members, students and guests spent a very interesting and profitable evening as guests of this prominent manufacturing concern. A very excellent meal was provided in the Company's spacious cafeteria, and as it was concluded, the members left in groups of 12, for what proved to be a very interesting and informative tour of the plant, during which the various processes were explained and questions answered by members of the staff who acted as guides.

In addition to visiting the plant, we had the pleasure of hearing Mr. B. G. Jackson, Chief Buyer, and Mr. D. M. Young, Personnel Manager, who spoke on "World Raw Material Situation", and "Job Valuation of the Clerical Staff", respectively.

It was a most enjoyable evening and the thanks of the Chapter were extended to Mr. W. M. Lane, and through him to his Company, by our Chairman, Mr. H. M. MacDiarmid, who emphasized that the extent ot which our hosts had gone to assure a successful meeting was fully appreciated.

VANCOUVER

The December meeting of the Vancouver Chapter was held on Thursday, December 5th, at the Georgia Hotel, Vancouver, B.C., when approximately forty members and guests were present. In the absence of the regular Chairman, Mr. Dick Lucas (who was under the Doctor's care, but is now active again) the chair was taken by Mr. Kennedy Orr, the Vice-Chairman.

Our Guest Speaker of the evening was introduced by Mr. Victor Feimann (who had recently returned from a flying visit to Shanghai, China). The Speaker was Mr. Howard S. Coulter, whose talk was entitled "In Search of Canada". Mr. Coulter, during the war years, was attached to the Intelligence Division of the Canadian Army overseas and was loaned to the British Department of Information, and was sent on a speaking tour to practically every city and hamlet in the British Isles to encourage British citizens in the various war work, by assuring them that Canada was rallying to their support and supplying the "tools" so urgently needed by their fighting Prime Minister, Mr. Winston Churchill.

Mr. Coulter is well-known in British Columbia for his outstanding gift of oratory and we were all given a real treat by the manner in which he handled his subject, more particularly when he recounted his personal reactions on returning home to Canada to find that he had to go in search of Canada again, when he found the Canada he had so eloquently described to the British people did not seem to be such a compact and united nation as he had convinced himself it really was. He closed by urging his listeners to each go in search of Canada and by doing this sincerely, we would make Canada the type of country it really should be.

It was announced that the next Vancouver Chapter meeting would be held at the Georgia Hotel on Thursday, January 16th, when we would have as our Guest Speaker, Dr. Brennan of the Department of Commerce staff of the University of British Columbia.

VICTORIA

The December meeting of the Victoria Chapter was held December 19th at the Douglas Hotel. Attendance was only fair owing possibly to somewhat unpleasant weather conditions.

Feature of the evening was a talk by Mr. Pat Dunn, C.A., who had been invited to speak, his subject being "Various Accounting Systems Adaptable for Small Business Firms". Following this interesting talk the meeting was thrown open to discussion of other accounting subjects.

This Chapter is now making a point of reserving time, during all meetings, for open discussions which, it is felt, are mutually beneficial.

The meeting closed with unanimous expressions of regret at the enforced resignation of our popular chairman, Mr. George Marshall, who is

leaving Victoria. It was further announced that Mr. S. E. Espley had been appointed chairman to fill his place for the unexpired term.

WINDSOR

The regular general meeting of the Windsor Chapter of the Society was held in the Norton Palmer Hotel on Thursday, November 28th, 1946, with an attendance of 41 members and 11 guests. Our speaker of the evening was Mr. W. H. Furneaux, Vice-President of Aerovox Canada, Limited, Hamilton and Past President of the Canadian Society of Cost Accountants and Industrial Engineers. Mr. Furneaux chose as his topic "A Stabilizing Wage Plan" and outlined a plan in existence at a manufacturing company, which was quite a radical departure from normal yet which appeared to solve most labour troubles. Being a subject very interesting to those present, the address created a lively discussion period afterward. The meeting adjourned at 10:00 o'clock p.m.

Current Literature Digest

By Harold Bricker, C.G.A., R.I.A.

"The Controller," recently published a timely article by A. T. Waidelich under the heading of "Modern Plants and Production Savings". In this article there are numerous points which may be of interest to our readers. He describes the ultimate in modern plants.

The largest capital expenditure for most companies, and one that occurs only at infrequent intervals, is for a major modernization program or for an additional plant, new. Therefore, the step is an exceedingly important one which deserves careful analysis. Basically, this analysis must balance the correctly amortized first cost against the total operating cost. Unless BOTH the amortized first cost and the total operating cost are considered, the resultant decision may be seriously in error.

Of the engineering problems, six stand out as most generally applicable.

1. The geographical location of the plant.
2. The choice of the plot of ground.
3. Should it be a special purpose plant or a general purpose plant?
4. What useful life will the plant have?
5. What expansion may be anticipated?
6. The design of the plant.

It is pointed out that the industrial architect or engineer is not called in, all too often, until after the first five have been given the most offhand consideration and the last problem is reached. While many firms do give all the factors study, there are still too many firms that do not consider engaging engineering counsel, when professional counsel has clearly demonstrable value in cold dollars and cents.

COST AND MANAGEMENT

Economy in the first cost can be secured in the design and construction

The present plant building program reflects a determination, on the part of industry, to meet the bogy of rising labor rates by improved plant efficiency.

It is a recognized fact that more efficient manufacturing methods offer the best means of reducing costs and holding prices down to levels which will insure the steady expansion of purchasing power and the continued improvement of living conditions, here and throughout the world.

JOB EVALUATION

"Factory Management and Maintainance," recently pubished, "Launching a Job Evaluation Program", by G. H. Metz, wage and salary administrator of RCA Victor.

While the procedure concerns a large organization there are many points of interest to the smaller type of business.

If one is not sure of getting one's money's worth in labor costs,—and one wishes to find out; how does one start?

The war production gave job evaluation a mighty boost. Competition is already helping to establish its use as an important peace time management tool, although there is no guarantee of success with such a program. It is therefore vitally important in approaching scientific appraising of labor costs to get the program off to a good start.

The success of such a program will be, largely, in proportion to the ability and "know-how" of the personnel assigned to it. Without fully qualified and adequately trained personnel, the program is fore-doomed, if not to failure, at least to limited success. The best groups of employees from which to select job analysts are those who are accustomed to dealing with the plant's occupations on a day-to-day basis. Recruiting line analysts from in-plant personnel will provide the balance needed to offset this lack of plant knowledge on the part of the supervisor.

Forms have been designed by large firms with spaces highly detailed and compartments to provide a specific places for the answers to specific questions. Regardless of the type of form used, four essential kinds of data must be listed.

1. Identification information. This section identifies the job, its physical and organizational locations, its code or serial number, the name of the analyst and the name of the foreman or supervisor who verified the content of the analysis for correctness and completeness. A brief summary of the job is usually included in this section.

2. Selection and placement detail. One of the most important uses to which job analysis information can be put, in addition to job evaluation, is in the selection and placement of personnel for your plant. Certain types of information are needed to assist the interviewer. This includes education and experience required, special clothing and tools needed, and the physical requirements of the job. Some of this information is already listed in that needed for job evaluation.

3. The work that is done. This is usually written in functional order (for example, setup, operate, remove from machine, and pack) and is

divided into a number of sections. An indication of the skill level required by each element, and the percent of time devoted to it, are customarily part of the work performed section.

4. The qualities and activities that the job requires the worker to have or to perform. Most job evaluation plans are based on an assessment of five types of requirements made on the worker by the job, although many plans subdivide these five elements. They are skill, mental effort, physical effort, working conditions and responsibility. The information needed to evaluate the jobs is gathered under this section, usually called job requirements.

The staff selected for job analysis must be carefully trained through a series of lectures followed by class room and "on the job" practice in job analysis. Basic theory should be explained in a series of lectures followed by practice in job analysis, observation of an experienced analyst at work, and finally in the writing of job analyses under guidance.

The training of the staff covers the following course of instruction:

1. Job analysis theory.
2. Practice in writing job analyses.
3. Observation of an experienced analyst.
4. Analyzing a job simultaneously with experienced analyst and comparison of the results.
5. Analysis of two jobs under the immediate guidance of the supervisor.
6. Analysis of first job under ordinary supervision and a critical survey of the results of the training.

Where the main body of workers whose jobs are to be analyzed are represented by a union, it is advisable to inform the union in advance of the objectives of the program and the method to be followed.

With trained analysts, fully informed on the techniques, working under an experienced job analyst, and, with the cooperation of your supervisors and your employees, such a program is half way along the road to successful completion.

Accounting in the Shoe Manufacturing Industry.

In a recent edition of the Journal of Accountancy, Louis E. Zraick has given some interesting comments, although, his ideas and opinions are considered as not reflecting the views of any government agency.

He states that in the work of to-morrow, accountants will devote more time to cost accounting and to the problems of cost control.

The account setup is referred to very generally and he offers no detail in this respect. The materials vary in nearly every individual factory. In pre-war days treated skins of mammals, reptiles, birds and fishes were widely used. With rationing, restrictions were placed on shoes with leather and rubber outsoles. Non-rationed items were made of fabrics and synthetic materials. The design and construction of footwear includes the makeup of footwear in every detail, so that, any two items of footwear, of the same design and construction, are necessarily identical except in size, but it does not refer to the means whereby footwear is manufactured. The list of methods of construction varies almost with each factory and

could therefore not be complete. The lines vary in dress, work, athletic, slippers, sandals, playshoes and all other types of civilian and government boots and footwear. The government war time material controls restricted age-sex, size and materials for the war period. These restrictions are being relaxed and the competitive market will soon be demanding an ever increasing variety of qualities, shapes and sizes in all purpose type shoes.

In the manufacture of shoes there must be a reasonable supply of materials on hand to assure a continual flow of production in the fabrication with a head of work in process at each machine or work table. There should be a stock of finished goods to meet the sales demand.

Note—This article is evidently the work of a pure accountant, therefore a number of changes are being made to more nearly approach proper costing.

In the smaller class of shoe factory the cost classification might cover materials, direct and indirect; labor direct and indirect; plant supervision and administrative accounts.

Direct materials could include the following:

1. Upper materials: the vamp, quarter, tip, strap, brace, lacestay, tongue, heel cover.
2. Lining materials: the tongue lining, quarter lining, vamp lining, front lining, heel stay, and heel pad.
3. Bottom materals: the outer sole, midsole, tap, welt, heel, top lift, inner sole, shank, counter, box toe.
4. Packing materials: individual cartons and tissue paper.

Indirect material is material that is used in such a way that it cannot be charged to any particular unit or group of units of product. Such items are necessary to the process of manufacture, and yet they either do not get into the product itself or the amounts of them are so small or they are so used that they are not easily measured.

It has been found more practical in cost recording to include indirect materials such items as: General findings, binding adhesives, gore, laces, silks and threads, tacks, nails, cleaning and repairing materials, bottom-finishing materials, embossing.

Indirect labour and direct labour are recorded on the usual basis. In the case of direct labour there are certain conditions due to war time labour turnover which might be commented on as follows:

1. Labor operations paid at hourly rates result in a higher cost per pair than similar operations paid at piece-work rates. Experience has shown that there is a general reluctance on the part of employees to work at piece-work rates.

2. Due to a shortage of manpower during the war, the shoe industry was compelled to employ unskilled help to a great extent. This was especially true in the fitting, packing, and cleaning departments. A minimum wage was guaranteed to each new employee. The difference between the earnings computed at piece-work rates and the agreed contracted minimum wage was paid by the management each week. This loss on piece work, which was not recognized by the Office of Price Administration, is often referred to as "make-up" costs. This is a hidden element of cost

that was prevalent on a large scale during the war, and still continues in many plants.

3. A comparison of labor costs for children's slippers with women's slippers discloses few differences in cost. The costs in the fitting, making, and packing, rooms are usually substantially the same. In the cutting room, one platform is cut instead of two. The first lasting operation and the operation known as "spotting the platforms" are usually cheaper. The total difference in unit costs between children's sizes and women's sizes ranges from 10 to 15 per cent, depending on the type of materials used, and the construction of the shoes.

4. All shoes and slippers made with a wedge construction have a high cutting cost due to the carpentry work involved.

5. The labor cost for closed-back slippers is higher due to the use of a "counter" which results in several additional labor operations in the fitting room.

6. Slippers made with "gore" have a higher fitting-room cost due to the narrow trimming, and stitching operations necessary.

7. The direct cost of a shoe is dependent, to a large extent, upon three factors:

(a) Percentage of operations paid on an "hourly basis", and percentage paid at piece-work rates.

(b) The experience or lack of experience of employees paid at hourly rates. The length of time a worker is employed has a vital bearing on direct labor costs.

(c) The number of styles being made, and the frequency of changes in labor operations.

It has been stated that in the industry so large and divesrified as the manufacturing of shoes, less than 20% of shoe manufacturing have cost systems operating efficiently on a practical basis.

In this coming period of keen competition, it is more obvious that management is going to require more reliable cost data. The operational control provided through cost information is even at present a very competitive factor.

This article was written primarily with a view of making public accountants more cost conscious in their audit work. It is also a challenge to Cost Accountants. In this type of business there can be very little generalizing because of the lack of manufacturing standards between various shoe manufacturers.

THE CANADA YEAR BOOK

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To-Day's Challenge to Industry

By HAROLD RILEY
Engineering and Management Services Ltd., Toronto

Never before has industry been faced with so great a challenge as that which confronts it today, when it finds itself in a state of transition for which it has no criterion. The whole tempo of our industrial life was accelerated during the war period. Violent changes took place in our ways of doing business and in our methods of living. Spurred by the exigency of war, technological advancement of a century was crammed into a few short years. Canada rose from the position of an agricultural nation to a place of eminence among the industrial nations of the world and we enjoyed a period of unprecedented prosperity. Coincidently with this, however, there was taking place in other countries of the world colossal devastation of the means of industrial and agricultural production constituting the greatest destruction of wealth ever known in history. Such economic and social upheavals were bound to have far reaching repercussions.

Consequently, when the war ended, industry found itself facing the task of meeting immense shortages of all classes of goods in the domestic market, of assisting in the rehabilitation of many countries devastated by war, and of supplying heretofore undeveloped markets in South America, India, China, and other countries, whose trade doors were being opened wide to receive our products. However, this inviting prospect was not without its problems. Production of civilian goods had been drastically curtailed, if not entirely stopped, and the transition from war-time to peace-time products had to be undertaken. New and more modern equipment had been installed during the war period and greatly improved manufacturing techniques had been developed which now could be adapted for commercial purposes. But of what use these increased manufacturing facilities and new techniques when materials were in short supply and there no longer existed a system of priorities by which essential raw materials and parts were practically assured. Then, too, the facilities of other manufacturers had to be reckoned with—not only were the old competitors in the field with enlarged capacities but others had been added, in many cases with the newest equipment provided by government finances as war-time projects. Expansion had been so great that it is doubtful if there is a single industry whose productive capacity has not been increased to the point where it will be in excess of normal domestic and export requirements when the first splurge of consumer demand is satisfied. Nor would competition be confined within the range of industry competing with industry but it would sharply extend to that of nation competing with nation. Such a situation surely called for the best effort industry could make and for the continuance of the energy, initiative, and co-operation of management and labour which had accomplished such remarkable results in war-time.

Industry had gained much in those years. The life of many a dying enterprise had been prolonged. All had benefitted in some measure from

new and improved equipment and better working facilities and conditions. Profits swelled to undreamed of dimensions. Labour rose rapidly to a position of power and as it saw its take-home pay decreasing with the introduction of the payroll deduction method of tax collection, steadily increasing tax rates, victory loan instalment payments, and a multiplicity of other deductions, it made a series of demands for higher wages until wage rates greatly exceeded those of the pre-war period. Organized labour had made considerable progress during the war and the gains it had made it intended to hold. With an eye on the greatly increased prosperity of industry, and having in mind the contribution it had made to the war program, and conscious of its vastly improved social status, labour concluded it was entitled to a still greater slice of the industrial melon. Management, on the other hand, believed labour had obtained more than its fair share during the war, that some of the increases wrung from it had been granted under expediency and it felt in many cases that current wage rates were already greater than industry could carry in the post-war period, particularly while selling prices were under government control. Consequently, the show-down between management and labour, which everyone saw coming but no one did anything to prevent, was staged at a time when the whole world was crying out for our goods. Production was stopped in essential industries, adding disruption and curtailment in many dependent industries, at a period when only by production, and greater production, could labour hold the gains it had worked so hard to secure, and when only by production and greater production, could management hold its costs below fixed ceiling prices and thereby operate on a sound basis. The epidemic of strikes which spread over the country has passed, but it has left a greater complexity of problems in its wake. The cost of the wage increases that were granted have not yet been offset by an equivalent increase in productive efficiency so that price increases have followed the wage increases in many cases, and it would appear that no one has benefitted.

The higher wages which have grown out of the war period is not the only increased element of cost industry must absorb. Almost every cent of material cost represents wages paid out to somebody—in the forest, in the field, in the mine, and in the various stages of processing—so that materials are now costing more. Then there is the third item of cost—overhead—which includes wages and salaries not allocable directly to the manufacturing of the product, supplies used and services provided in the plant and office, and fixed charges which run on whether the business is producing or not. The ratio of increase in this third category—overhead, or burden—in many instances has far exceeded that of direct wages and direct material, and for this management itself must accept much of the responsibility. During the war, with costs playing a secondary role to production, the emphasis being on quantity and quality rather than price, industry developed some dangerous tendencies. Many new products were put into production for which there were no established costs and the urgency of the war situation led the government to assure the manufacturer of payment of his cost together with a profit, generally related to the total cost of the product. This tended to place a premium on inefficiency, and

with the government confiscating all profits in excess of those earned in the pre-war standard period, the viewpoint developed that extra expense did not matter, as it did not cost the business anything, the government just receiving that much less tax. So management relaxed its vigilance over expense (perhaps a considerable understatement in some cases). Consequently, whether industry likes it or not, it finds itself face to face with an increase in all the elements of cost—wages, material, overhead.

So much for cost, let us look at the other side—sales. For a number of years business has grown accustomed to operating in a seller's market. There has been no difficulty in disposing of everything that could be manufactured. The demand for implements of war required ever increasing production and, as already mentioned, price was a secondary consideration. The production of civilian goods was so restricted that with the increased purchasing power created by higher wages and higher employment the available supply was always far short of the demand. Generally speaking, substantial profits were earned, notwithstanding the restriction on selling prices of commercial goods, because the amount of overhead expense charged to the high volume of war production resulted, in many cases, in a greater than normal profit being earned on commercial goods. Since V-J Day industry's largest customer— the government—has ceased almost entirely to do business, but the public has stepped in to fill the shortages created during the war years and has greedily absorbed everything that has become available. In the meantime, price control has continued in effect and government policy appears to be that only as the level of supply tends to approach the demand will controls be lifted. No doubt a slightly higher level of prices will obtain for some time, in order to absorb increased labour costs, since wages, as already stated, have risen more rapidly than industry can pay for by increased efficiencies. But intense competition eventually will ensue and, sooner or later, prices will be governed by what the public will pay, which, in turn, will be determined at the lowest level the most efficient producer can obtain and still earn a reasonable profit. Consequently no business can rely upon being able to cover up inefficiencies and extravagancies in its operations by increasing prices.

Industry will not only face price competition, it will face product competition as well. Many new materials, such as plastics, synthetic rubber and fibres, new alloys, and the like, will be available as alternatives to products formerly used and almost any business may find its market invaded from an unsuspected quarter and the demand for its products may disappear overnight.

Surely this whole situation must cause industry to pause for reflection. Neither management nor labour can evade the issue. It concerns both alike and prudence dictates that its consideration be not deferred otherwise both will go down together in the wreckage of the capitalist system. It is abundantly evident that what industry MUST do is attain GREATER PRODUCTIONS to meet the demand for HIGHER WAGES and at the same time LOWER UNIT COST to prevent inflation so that the workers may achieve their goal of higher real wages, for no one in his senses wants to see a reduction in the standard of living we have laboured so hard to

attain. At the same time industry must OPERATE AT A PROFIT thereby constituting the greatest assurance of security to employees and the surest guarantee of survival of our system of free enterprise—the best system the world has known. This is today's challenge to industry. It is capable of simple statement but it represents the most complex problem ever encountered in industrial history. It is a challenge worthy of the best of us. It is a challenge which presents unlimited opportunity. What are we going to do about it?

Meeting the Challenge

Obviously business conditions as we face them today and in the future cannot be anything like those we have known previously. Our past philosophies and techniques cannot be expected to meet the requirements of today's conditions. We cannot set back the clock to 1939. And yet it appears that many an executive who formed his conception of management in a period when the method of combatting competition was to shield behind a tariff wall, when the idea of success was to monopolize the market and charge a high price, when the remedy for an unsatisfactory profit situation was to raise the price, when labour was looked on as a commodity, when the idea of cost control was never entertained, when the only available accounting information was an annual financial statement—many an executive who formed his conception of management under these conditions is instinctively thinking of the future in terms of this well remembered past. But the benevolent economy of by-gone years which permitted business to exist under these conditions is gone forever, and we must face the fact that we are now living in a different economic era. Nor will enterprises whose operations were magnified in our national wartime industrial picture continue to hold those positions automatically in our peacetime structure, for nothing is static. The stability of any organization that is failing to adjust itself to the ever-changing conditions is threatened.

How can industry meet the challenge? By inefficient management? By unmethodical operation in the plant? By hit-or-miss methods of providing materials at the required time for a job? By failing to plan ahead for the workman's next job? By using obsolete equipment and methods in the factory and office? By permitting wasteful methods? By poor relationship between management and labour? By slowdown? By featherbedding? By lack of policy or weak policy throughout the organization? By lack of co-ordinated effort? By perpetuating the extravagancies of the "cost-plus" years? By the preparation and preservation of a multiplicity of forms and records that are of little or no value because the source of the information is unreliable? By waiting until after the close of the fiscal years to know whether the business operated at a profit or a loss? By basing selling prices on those of a competitor without knowing one's own cost? By not knowing at what price and volume levels a product becomes unprofitable? It is axiomatic that to-day's battles cannot be won with yesterday's implements. Yet many businesses are entering an industrial war for the survival of the fittest with outmoded methods, with no objective, with no co-ordinated plan, and with forces split with dissention.

The answers to the problem are many and complex. It will not be enough merely to revise the old methods in the factory and in the office, tinkering with a few adjustments here and a few adjustments there. Machinery and manufacturing techniques need to be modnernised. More efficient methods will have to supersede the cumbersome and fatiguing routines which were good enough before the war and during the war, in order to eliminate waste in time, in energy, and in material, from the first operation on the product up to the time it reaches the purchaser. Many new materials developed during the war will have to be adapted to peace-time uses to take the place of pre-war materials not yet available in sufficient quantities, or to speed production, or to lessen cost. New products must take the place of those that have lost their appeal. Markets must be studied and marketing methods revised. Management must replace a policy of positive action for one of aimless drifting. Management must substitute a spirit of stewardship for dictatorship. Harmony must supplant disunity throughout the entire organization. Cooperative teamwork within management itself must replace jealousies, rivalries, disputes, and dissatisfaction. Labour and management must realize that more will be gained by working together than fighting together. Labour's policy must be "a fair day's work for a fair day's pay", instead of "slowdown" and "featherbedding". The wage and salary structure must be reviewed and consideration given to the introduction of a sound plan for payment of additional remuneration for improvement in performance. A system of effective management control which can see into the future will have to be given a place of greater importance than historic financial statements. Dynamic costing must take precedence over general accounting. The industrial accountant must have a position of eminence in the organization instead of one of obscurity and insignificance. The functional organization must be studied to make certain that authority and responsibility are clearly defined and go hand-in-hand, eliminating overlapping and duplication. Written standard practices, job manuals, job descriptions and job requirements are needed to direct and control the actions of employees in accordance with a standard pattern carefully designed to promote smooth functioning, in place of disjointed individualism. The organization must be studied to determine whether it can be simplified and to make available some of its number to take up positive, constructive duties for those that are mechanical, antiquated and well-nigh worthless.

These are a few, and only a few, of the more general essentials for meeting to-day's challenge. Let us now look more closely at some of the major aspects of the problem and consider what appear to be fundamental requisites for attacking it. The task is not an easy one. It is going to take courage, a lot of hard work and personal sacrifice. Nevertheless, the results will be worth it. The alternative is industrial suicide.

Management's Part in Meeting the Challenge

The place to start to meet the challenges is in management itself, since management must accept the responsibility, set the proper example, determine the policies, make the decisions, and take the initial steps in the procedures. But somehow one cannot help asking how in the name

of common sense management can face the challenge without the necessary tools, and, in some instances worse still, without knowing what tools it needs and what tools are available.

What management needs more than anything else is a goal and a yardstick to measure its progress toward accomplishment. It will not be enough for management merely to make up its mind to PRODUCE MORE FOR LESS. Even in the realm of sports we have something more definite. There would not be much point to any game if it did not have some objective; the pitcher does not just throw the ball anywhere—he has the plate to aim at; the batter has an objective too, whether it be to drive the ball out of the park or to lay down a bunt; the golfer does not smack at the ball aimlessly—he strives for all he is worth to go round the course in as few strokes as possible and he is able to measure his accomplishment stage by stage against "par." If management is going to achieve maximum results and know how it stands along the way it must have a goal and a "par" measurement. The goal must be LOWER UNIT COST and the yardstick, or "par", must be supplied by a system of cost control.

Before proceeding to the subject of cost control it is necessary first to point out that management must do some intensive self-analysis in regard to its attitude towards vital, dynamic, fundamental control information. Where management is not getting this data it must admit the fact. It must ask itself if it is not true that it has failed to show the same interest in reducing costs as it showed in increasing sales. It must ask itself if it is not true that it has looked on its cost department as a liability, and on its sales and production departments as assets. It must ask itself if it is not true that its policy has developed an unbalanced organization. It must ask itself if it is not true that it has made no effort to reduce the less tangible elements of cost but has merely cut down personnel. These, and other questions it must ask itself, and more important, it must do something about the answers it gets.

Where management has carried on in the past without a system of cost control it is not as great a reflection on itself as might at first appear; the fault will lie in attempting to operate in the future without one. Some things must be said in extenuation of management. By and large top ranking executive positions have been reached through the sales and production divisions of enterprises and many of these executives have never had a chance to use the accounting techniques that have been developed for the purpose of management control. Perhaps they have never been told about them. Perhaps they are not aware that in the past few years immense strides have been made in cutting out cumbersome procedures and red tape and that the effect of anything that happened yesterday in the organization can be known to-day—that in most cases, the results of yesterday's business can be known to-day. The industrial accountant himself has often been to blame because he has built a clumsy process of records which has failed to supply up-to-the-minute or accurate information and management has accustomed itself to looking on cost records as unreliable ancient history of no vital consequence to the conduct of the business. The fault will lie with management if it clings to some

outmoded system of records which outlived its usefulness many years ago. It behooves management to instal the most-up-to-date cost control system in the office as the most modern type of equipment in the factory.

It is disconcerting, on discussing the matter of management control with the top executive of an organization to be told, "We have all of these things", when actually they have none of them. Would he say they had illumination in their engineering department if all they had was candle light? We would probably find fluorescent lighting there because someone in authority has made it his business to find out what is most up-to-date and efficient in lighting equipment and has been satisfied with nothing short of the best that is available.

Sometimes a president or general manager will say he receives adequate control information when what he gets near the end of each month is an operating statement for the preceding month, which is found on investigation to be based largely on guesswork; for example, the key figure—inventory—will have no factual basis. Or again, he may say he has a satisfactory cost control system, when what he has got is a list of comparative unit costs. Usually this is built up tediously from time records allocated arbitrarily to jobs by the workmen themselves, and from material lists that have not been checked recently for changes, and that have been priced haphazardly. To this there has been added an overhead figure of which the best that can be said is it forms a convenient percentage for purposes of calculation. Usually there is no relationship between the figure of total material used in the month according to the cost records (if these are totalled at all) and the amount by which the inventory has been relieved in respect of material in the financial records. Not infrequently the records referred to are a month or two out of date. That is not cost control; it isn't even costing.

The senior executive of a company which had employed a consulting engineer to improve efficiency in its plant confessed that he did not know whether the engineer had made a good job or not. Information was elicited to the effect that the company had no means of measuring the results of the engineer's work—it had no cost system. It based its prices on those of competitors and made a guess at the percentage of gross profit it was earning. From one year-end to the next it did not know with any degree of accuracy whether its operations were profitable or otherwise. Small wonder the company has paid no dividend on its common stock in the twenty years of its existence (the predecessor concern was as bad), that the preferred stock dividend is many years in arrears, and that it has no earned surplus but a deficit.

These are not isolated instances. Nor is the condition to be found only in small organizations. The comments apply to a large number of companies with hundreds of employees and financed by public stockholders. Surely management must insist on having the tools to enable it to manage better than that, instead of being content with just doing a good enough job to get by.

The Industrial Accountant's Part

It must be abundantly evident that the duties and responsibilities of

the industrial accountant are going to be onerous and exacting. The part he is called upon to take in meeting to-day's challenge to industry could be of even greater importance than that of any other person in the organization. On him will rest the onus of furnishing management with much of the information by which the activities of the enterprise must be controlled if the entire business is to be successful. Consequently, he must have wide vision, discernment, sound judgment, courage, ambition, energy, inititaive and tact. He must know his subject thoroughly, from the practical as well as the theoretical aspect. He must be industrious and studious, keeping abreast of all the latest techniques. He must develop a system to fit the exact needs of the business he is engaged in, becaues there is no ready made system that will meet his requirements. He must undertake an educational campaign so that everyone from the top to the bottom of the organization will be cost conscious and will realize the full importance of competitive costs. He may have to teach management how to interpret the control and other cost information he will develop. He must be prepared to sit in with sales and production executives and tell them the effect their proposals will have on the business. He must furnish management with data to determine company policies. He must work morning, noon and night until his department takes second place to none in the organization in importance and efficiency. He must be fitted to step up to a higher level in the organization than he has occupied in the past. He could develop into the chief executive's right hand man, and eventually he himself might become the chief executive. This is the goal to which the industrial accountant should aspire.

Meeting the Challenge by Cost Control

As previously stated, cost control is the paramount requirement of management to meet to-day's challenge to industry. The need of greater production is being stressed in many quarters, and rightly so, but equal emphasis must now be placed on the cost aspect, for no longer can cost be relegated to a secondary role.

Cost control, like any other control, can only be sound if it has a factual basis. Otherwise, how can it be wisely exercised? At the same time, to be effective the system must be neither cumbersome nor elaborate. Only key information should be presented to managment unless something is wrong, when the details will be submitted to show where the trouble is.

It is self-evident that the best time to control cost is before it takes place. Consequently for purposes of control an historical type of cost system is of limited value. Controlling cost before it takes place implies the predetermining of the cost of an article before it is made. And why should not this be done? The type of system by which costs are predetermined is the "standard cost" system, and it is a prerequisite of cost control. This is not to be construed as meaning that all predetermined costs are standard costs; insofar as costs are based on guesswork or matters of opinion they do not constitute standard cost. Predetermined costs to be used as standards for control purposes must be carefully prepared by the intelligent use of basic information gathered from various sources. It is not the present purpose to outline the procedure for setting up a

standard cost system—there is an abundance of literature available on the subject—but rather to indicate the place of standard costs in cost control. Suffice it to say that in determining the standards for control purposes consideration will be given to past experience, current operating conditions, and future trends.

The advantage of the predetermined or standard cost is obvious. It not only shows how much the product should cost under given conditions, but it also provides a yardstick to which the actual cost may be compared. The points at which the comparisons may be made will vary according to the nature of the business and the refinements of the system, the latter being a matter to which the industrial accountant must devote unceasing attention. There is, however, one general yardstick, a comparison of predetermined cost with the actual cost for the corresponding period, as shown by the financial statement, whether the length of the period is a month, a quarter or a year. It is hardly necessary to point out that the shorter the period for which the comparison is made the more effective the control will be. It should be possible to make a comparison each month when the entire system is in operation, because the standard cost system, in addition to furnishing cost reports, will provide the key figure for inventory purposes, thereby eliminating what is generally the stumbling block to the preparation of monthly operating statements.

In a properly co-ordinated system it will be possible to compare the various items comprising the predetermined cost with the corresponding items in the operating statements. The amount of material, direct labour, and overhead costs shown in the former can be compared with like items in the latter. Overhead will be broken down and appropriately classified. Where corresponding items are reasonably close in amount it will not be necessary to spend further time in detailed analysis. Only where variations occur will it be necessary to investigate further.

When a variance in total cost is shown an analysis will have to be made to determine the cause. It may be disclosed, for instance, that the actual indirect labour has exceeded the amount set up in the standard. It becomes necessary then to ascertain the underlying reason and to fix the responsibility at the proper source. This further investigation may reveal that some highly paid operators who should be used exclusively on productive work had been put on some other duties in a lower wage category for which they had to be paid their normal rates as laid down in the company-union agreement. The superintendent may have failed to plan the operators' work sufficiently far ahead.

Some businesses experience a considerable loss of production due to breakdowns, but an examination of the operating statements does not reveal this fact. With a system of cost control breakdowns would be indicated by a variance and the amount of the loss occasioned by the stoppages could be ascertained. The loss is not confined to wages—it is loss of production and that means loss of wages, unabsorbed overhead, and loss of profit.

Variance from standard or predetermined cost indicates that there is need for control, the analysis to determine the cause leads to the trouble

spot, the underlying reason explains the trouble itself, the fixing of responsibility shows where the remedy must be applied.

Determination of profitable volume levels is one of the most urgent requirements of many businesses to-day, and this aspect of costing may be the greatest aid to management in formulating sales policies. In view of the competitive period industry is facing, many businesses will find it impossible to use the old pricing formula, namely, cost (often arrived at by guesswork) plus a profit. It will frequently happen that prices are regulated by those of competitors or by what the public will pay. Where the business has only one product the problem is a fairly simple one. If the business is unprofitable the industrial accountant must determine at what volume level it would become profitable. Management will then consider ways and means of attaining this higher sales volume. At the same time management should look into the possibilities of reducing manufacturing, selling and distributing costs. In cases where management has examined the possibilities of cost reduction it appears that the effort has been confined almost entirely to the manufacturing section of the business and that little, if any, thought has been given to the expense of distribution.

Since few businesses have only one product, management's problem in the vast majority of cases will concern several products, sometimes running into a large variety. It will then be necessary for management to know the costs not only at various levels of sales volumes but also based on several mixes of products. In the event of some of the products showing a loss at the normal sales levels, management will want to know how much overhead these have carried, and, if they are discontinued what effect this would have on the cost of the remaining products.

The industrial accountant will find a break-even chart to be a valuable tool in furnishing answers to many of management's questions, especially where volume has a bearing on the matter. The break-even chart has not been used extensively in the past but it is essential to-day.

A standard cost systm, though an essential part of cost control, is not the only part—it is not sufficient by itself. Standard costs deal with current operating conditions and are static. Consequently, since the point has been stressed that industry is in a transition period when nothing is static, and since we are seeking to meet the challenge presented by an ever-changing industrial situation, something more than a static cost system is needed. When business itself is not static, it cannot be guided by a control that is static. The type of control required by management to meet to-day's challenge to industry is a dynamic control. This is accomplished by combing a variable budget with standard costs. Cost control is then a science that deals with exceptions and a science that moves.

In order to avoid misunderstanding it should be pointed out that cost control is not synonymous with cost reduction. Cost control means keeping in line with predetermined cost. Cost reduction is the planned attack which should follow cost control to attain a still lower cost figure.

Industrial management might learn something from the western farmer. It would appear that if his profits fall below those of the best year in his

history the farmer considers he has sustained a loss. In other words, he thinks not in terms of the profit he made, but of the profit he did not make. Management must focus its attention on the profit it is not making.

To sum up: a financial statement shows how much profit the business made; a system of COST CONTROL CAN TELL MANAGEMENT HOW MUCH PROFIT THE BUSINESS LOST AND WHERE IT LOST IT; a cost reduction plan put into effect is an intelligent effort to save lost profit.

In subsequent articles in this series some of the techniques used in cost control and cost reduction will be dealt with, including budgeting, inventory and production controls, labour and overhead controls, wage and salary administration, and industrial relations.

Assistant Factory Manager

ROY J. CRAIG

The National Cash Register Company of Canada Limited, Lansdowne Ave., Toronto, through Mr. A. Cameron, Factory Manager, announces the appointment of Roy J. Craig as Assistant Factory Manager.

Mr. Craig, who has been associated with the Canadian Company for 28 years, will retain his position as Advertising Manager.

Cost Accounting for The Mining Industry

By HOWARD C. POOLE, C.G.A.

Thesis submitted to the Society of Industrial and Cost Accountants of Ontario

This Thesis is based on the costing system used by one of the largest gold mines in the world, but it is not an exact description of it. In an attempt to simplify the explanations as few figures as possible have been shown. Where figures are shown they have been used only to illustrate methods and have no meaning as far as the cost of the industry is concerned. **This Thesis is divided into the following sections:**

1. Introduction: A description of the industry and the manner in which the system is tied up with it.
2. Special features of mine accounting and this system in particular.
3. The classification of cost accounts and occupation codes.
4. Examples of tabulator cards and mine labor reports.
5. Working parts of the system with examples of forms:
    1. Distribution of Costs.
    2. Distribution Schedules.
    3. Recapitulation Sheets.
6. Form of the final cost statements—Details of Costs.
7. Manufacturing of Bits—Statistical Standard Costs.
8. Manufacturing of Timber—Estimated Costs.
9. Shop Orders and Special Orders.
10. Special Reports.
11. Unit Production Costs for Tonnages—Budgetary Control.

INTRODUCTION

A DESCRIPTION OF THE INDUSTRY AND THE MANNER IN WHICH THE SYSTEM IS TIED UP WITH IT

The main business is the mining and milling of gold ores. Since operations are conducted on a large scale it has been found profitable to do considerable manufacturing and some construction. Some of the mining equipment such as loading pockets, timber trucks, mine cars, parts for mine drilling machines and numerous tools and small items of equipment are manufactured in the company shops. Such items are manufactured on shop orders and accounted for at actual costs.

A detachable steel bit is used for drilling and these bits are manufactured by the company for its own use as well as for sale to other mines in limited quantities. These bits are taken into the inventory at actual costs but a standard cost system is used to determine efficiency in manufacture.

All timber used in the mine is manufactured in the sawmill of the company. A large part of the timber used is treated in the modern treating plant operated by the company. Some treating of timber is done for other mines in the locality. The manufacture of the timber and the treating is entered in the accounts at actual costs but is charged to the working places at estimated costs. These estimated costs serve as a basis for distributing the actual costs.

COST AND MANAGEMENT

Most of the large construction work is let out to a contractor but small construction and work of a specialized nature is done by the company on Construction Orders. The work is accounted for in detail at actual cost.

During the war a large number of steam engines, pumps, and pump parts were manufactured in the shops of the company on War Orders (handled in the same way as Construction Orders).

The company uses a machine accounting system. A Numerical Tabulator (45 Column) does all the tabulating. Used with it is a high speed summary gang punch, a 45 column sorter and two electric key punches. All accounting information is given a code number which is punched on special tabulator cards. The cards are of different color to distinguish their use. All surface labor is reported directly on cards which are punched and are used directly in tabulating costs. The same cards are used for the payroll and the costs. The mine labor is reported by the shift boss on Mine Labor Sheets from which a card is punched. The cost department is repsonsible for the coding of all information. The supplies drawn from stores and the timber used in the mine is requisitioned on Tabulator cards which are coded and used directly to tabulate costs.

All invoices received are registered in the Invoice Register and are stamped with our own invoice distribution stamp.

Each vendor with whom the company deals has a serial number which is entered on the invoice along with the account to charge. An invoice list is made up with a summary of the invoices included from which the information is punched on tabulator invoice cards. At the end of the month these cards are sorted by vendors and run through the tabulator to obtain a tabulated list which makes up the Voucher Record. The voucher cheque is printed by the tabulator showing the vendor serial number and the total of the invoices for that serial number. The name of the vendor is typewritten on the Voucher Record and the cheque.

At the end of the month the labor cards are sorted into account order and a Combined Mine and Surface Labor Distribution run by the tabulator. The cards are then sorted into groups by occupations to make up tabulated lists for the distribution of shops expense. As the list is run for each shop the total labor and the account for the shop is punched on a tabulator card. After the lists have been run for all the shops these cards (one for each shop) are placed with the remaining labor cards to run a tabulated list for the distribution of overhead charges called General Charges. The total of this list must balance with the total mine and surface labor.

A payroll control book is kept by the tabulating department and all tabulated lists are balanced with it.

SPECIAL FEATURES OF MINE ACCOUNTING AND THIS SYSTEM IN PARTICULAR

It has become a standard practice in mine accounting not to distribute depreciation. On operating and financial statements it is shown as the total provided for during the period covered. A large part of the equipment used in mining has a life of five years or less and a maximum of 15% for all plant and equipment has been set up by the Income Tax Department. However a fair depreciation rate for all manufacturing operations has been

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worked so that a cost including depreciation may be given management upon request.

It will be noted that several other cost accounts are not distributed as Marketing Bullion, Head Office Expense, Administration, and Provision for Taxes. This corresponds to Selling and Administrative Expense in manufacturing industries which is ordinarily not distributed. The only Selling Expense in the mining industry is a small mint charge which is deducted from mint returns. This charge is included in Marketing Bullion.

This system provides for two separate overhead accounts, General Mine Expense applicable to mining operations and distributed to the mining accounts on a mine labour cost basis, also General Charges distributed to mining, milling and shops on a basis of labor costs.

The allocation of all distributable costs is on a labor cost basis. Generally the labor hours basis is considered the more accurate but in our case it was found that by using the same costs and distributing them on each basis there was very little difference. As the labor cost is the more rapid method it has been adopted.

With the exception of the Steel Shop no shops expense is distributed between shops. The other shops have small inter-shop charges which usually cancel each other out. However the Steel Shop is engaged mainly in manufacturing and the work done for it in the other shops is a more important item. Shops expense is charged on shops labor in the other shops charged to the steel shop but not the reverse. The work done by the steel shop for the other shops is always very small or none at all. These inter-shops items are marked out on the tabulated lists and the amounts deducted from the total labor before obtaining a factor for distributing.

The calculations for the distribution are made with a mechanical calculator. The amount to be distributed is divided by the amount over which it is distributed to obtain a factor. This factor is put in the calculator and multiplied by the individual amounts.

It is a pecularity of mine accounting that no Work in Process accounts are used. There is always ore in process in the mill as several days may be required to complete the milling process for any one unit of ore. However the amount in process is always the same so that over a period of a year or more disregarding it will not affect the costs.

Usually ore broken in stopes is disregarded also. Some mines (nearly always marginal producers) capitalize the ore broken. In this case the ore milled only is charged out monthly. There are several arguments both for and against treating broken ore as a capital asset. The policy is to maintain a constant amount of broken ore ahead and keep the relation between development and mining approximately constant. This results in a uniform cost base.

Shop orders and Special Orders are charged out to their respective accounts monthly. Each Shop Order has an individual record on which is shown the monthly and cumulative amounts. As a large number of the Shop Orders are charged to Supplies it is necessary to maintain a record of charges for items not completed. This is done by entering all charges for shop orders in a special place on the Inventory Record. When the Shop Order is complete and the items received at stores the total is entered in the re-

ceipts column. In this way the inventory records are always in balance with the control account.

The unfinished bits are estimated in terms of finished bits and this figure used for the costs and for the charge to Supplies. In this case the records do not agree with the actual count of finished bits as Supplies include some partly finished bits. This is unimportant as a complete record of finished and unfinished bits is maintained by the Steel Shop.

Very little timber is manufactured ahead of the daily requirements. The few small items which are manufactured ahead are usually made from waste and are ignored. As these items are approximately constant, and are so small in comparison with the total amount manufactured in any one month, it would not affect the cost appreciably if they were taken into account.

WORKING PARTS OF THE SYSTEM

1. Distribution of Costs Sheets

All of the costing is done on this large synoptican sheet which is actually a Ledger Cost Sheet. The entire month's transactions are entered on this sheet. All the charges are summarized and then redistributed here. All the postings to the General Ledger are from this sheet. The credits are entered in the column on the left and the distribution is made on the horizontal line in the debit columns across the sheet. As the master sheets has only 17 columns short sheets are used to provide a column for each account. These short sheets are cut off at the edge of the total column on the left side. Use is made of the reverse entry of journal items to record the distribution of debit amounts. Debits are made in red in the credit column and credits are made in red in the debit columns. The cash received is all entered in red. When the debit columns are totalled the red amounts are of course subtracted.

All items such as Provision for Depreciation, Provision for Taxes, etc. are handled on journal vouchers. At the end of the month a recap is made of all journal vouchers and the amounts posted to the Distribution of Costs on line number 33.

All changes in the distribution of charges due to error in posting or otherwise are made by making up a "Memo of Change in Distribution" in Journal Entry form and posting to Distribution of Costs on line number 34.

The postings to this sheet are from the Cash Book, Distribution Schedules and Recapitulation Sheets and are done in the order that the items appear on the sheet. The posting starts with cash and down as far as Tractor (line 17) they are made direct. At that point the debit column for Tractor is totalled and the amount distributed on the Distribution Schedule for Tractor. It is then posted to the proper debit columns opposite Tractor. The same procedure is carried out to the bottom of the sheet. In this manner the costs are collected in the vertical columns and distributed along the horizontal lines until finally the costs are all distributed to Production Costs. A Debit column is provided for each ledger account as well as the cost accounts so that all transactions for the month appear on this sheet. In this way all the financial transactions, special provisions, in fact the complete picture of the accounting is shown on this sheet. When the sheet is com-

plete and balanced the postings are made to the Ledger directly from this sheet.

As there are only 45 lines and a larger number of distributions are needed one line is used for two accounts in some places.

2. **Distribution Schedules**

The distributable costs are distributed on these sheets.

The methods of handling vary widely. An explanation of the origin of the charges and basis for distribution has been typed on the sheets in red. In a number of cases a tabulated list is used for distributing the charges and where this is the case the explanation appears on a sheet attached to the schedule in the same way as the tabulated list would be attached. In some cases the list used is two or three feet long and is folded in accordion fashion to the size of the page.

These sheets are kept in a loose leaf binder after being posted to the Distribution of Costs.

It is necessary to estimate some of the charges to the accounts which are distributed first. Where this is the case it is indicated on the schedule.

Each of these schedules is the distribution of the total of one column of the Distribution of Costs.

The schedules for the Framing Shed Cost Distribution is shown with the explanation of Manufacture of Timber.

Each sheet has a number stamped with a numbering machine.

3. **Recapitulation Sheets**

These are columnar sheets used to make recaps of various charges to an account or group of accounts.

1. **Supplies**: Before a tabulator was used Supplies were recapped on this sheet. Now a tabulated list is used to post the supplies directly to Distribution of Costs. Supplies Handling is distributed on this list on a basis of cost and posted to Distribution of Costs.
2. **Combined Mine and Surface Labor Distribution**: Since the tabulator has been used a tabulated list has been attached to the sheet and posted directly to Distribution of Costs.
3. **General Charges**: On this sheet the various charges to each account are recapped. The total of each account makes up the Details of Cost. As not all of the accounts in General Charges are distributed, those to be distributed have a check mark above the number of the account and the total of the accounts marked is distributed on Distribution Schedule number 33. The undistributed total is listed on Schedule number 1 as General Charges.
4. **General Mine Expense**: Treated exactly the same as General Charges except that the total amount is distributed on Distribution Schedule number 34.
5. **Shaft Charges to Plant and Equipment**: On this sheet is recapped development work (mainly in the shaft) which is in the nature of permanent equipment. The credits to the development accounts are posted in the Distribution of Costs on the line (number 40) for Shaft Charges to P & E but not in the space on the left for credits. The posting is to the debit columns in red. The debit is posted to the column for Plant and Equipment in the section of Distribution of Costs devoted to Ledger Accounts.

6. **Shop Orders:** On this sheet the shop orders are listed in shop order number and a recap made of all the charges. Above each shop order is written the account to charge. When the sheet is completed and balanced with the column for Shop Orders on the Distribution of Costs the amounts are listed in account order on Distribution Schedule number 13. All Shop Orders are charged out to their respective accounts monthly.
7. **Special Orders:** Treated exactly the same as Shop Orders.
8. **Journal Vouchers:** The journal vouchers which are made up for all special items and numbered serially are recapped on this sheet. They are listed by serial number on this sheet and the debits listed across the sheet. Items not belonging to any of the columns listed are posted in the miscellaneous space and the account noted.

   As all the recaps except Journal Vouchers are exactly the same only one of the sheets for General Charges shown. It takes three sheets to list all the accounts.

   The sheet for Journal Vouchers is quite different.

FORM OF FINAL STATEMENTS
DETAIL OF COSTS

The final cost reports present the information collected by the operations described heretofore. The information comes from the Distribution Schedules and the Recapitulation Sheets. The form varies from time to time depending upon management's desire for information.

These reports are ruled in red ink which makes the information stand out better and improves the appearance of the statement.

The unit costs and the cumulative costs are found by making a recap for each statement. A recap of cumulative costs is kept and carried on for each fiscal year.

There are forty of these statements made monthly. As many of them are similar only forms to indicate the different information are shown.

MANUFACTURING OF BITS
STATISTICAL STANDARD COSTS

The manufacturing of bits is a small item in comparison with the production of gold by this mine but it is larger than the entire production of many small manufacturing industries. It, therefore, is given careful supervision and accounting for costs.

Experiments have been made with taking the manufactured bits into supplies at a standard cost. In fact it was found that less accounting work was required with that method. However, management was not impressed as it did not give a true cost of production until adjustments were made both in Production Costs and Supplies Inventory. It was decided, therefore, to account for the manufacturing at actual cost and to show the relation to standard cost for control purposes on the Details of Cost.

The variances are accumulated for each fiscal year.

Bits manufactured for other mines are sold at a small profit. This profit does not enter Production Costs. It is credited to Sundry Profit and Loss.

The reconditioning of bits is about the same operation as manufacturing. The chief difference is that there is no new steel charged. However the cost of handling and preparing for reforging is just about equal to the cost of the

new steel. As a result both new and reconditioned bits used are charged to the same account. A separate supply account is kept for each and the cost average each month to give the rate at which they are charged out.

There are no Bits in Process on the records. At the end of each month the uncompleted bits are estimated in terms of completed bits and added to the completed bits for the costs and the charge to supplies. The supplies account then includes uncompleted bits but the costs are correct. Over a period of time the result is exactly the same as keeping an account for Bits in Process and considerably less work is involved.

MANUFACTURE OF TIMBER
ESTIMATED COSTS

All the timber manufactured is used in the mine so the cost of manufacture is a direct cost of mining. The only problem is to distribute the cost to the proper accounts. As the timber is used during the month and the exact cost of the Framing Shed is not known until after the month ends, the cost of each piece of timber used is estimated and charged on timber cards. At the end of the month a tabulated list of the charges on the timber cards is run. When the actual costs are known they are distributed over the accounts which were charged on the timber cards on a cost basis. This has the result of taking the costs into the accounts at actual. The estimated costs are used to get the proper charges.

The timber used is in standard sizes so all the pieces can be figured very closely. Prices for the raw timber are fairly uniform and when there is a change in price the estimates are changed accordingly. To get the estimated cost the material cost is figured accurately and the amount of labor required estimated. The average overhead charge is added to get the estimated price.

Each day the mine shift bosses hand the supply clerk an order for timber required. The supply clerk makes up a Move Order in triplicate showing the timber required and where it is required. One copy is given to the Framing Shed foreman, one to the deckman who is responsible for the delivery of the timber and one is kept for arecord. The shift bosses give their orders at the end of the shift. The Move Order is made up the same day and handed out at the beginning of the next day's shift. The timber is manufactured that day and delivered the next day. As soon as the timber is delivered the deckman sends his copy back to the Supply clerk with a note of the deliveries. Any variations from the Order are noted. Another report is given by the deckman "Distribution of Trucks" which shows all trucks received underground and the level at which they were unloaded. This report is used in tracing lost timber as the Framing Shed keeps a list of the destination of the timber trucks by number. When the supply clerk receives the Move Order from the deckman he makes up timber cards for all the timber delivered and back orders all timber not delivered. In this way the timber cards are dated for the day the timber is sent underground. On the same day the Framing Shed foreman makes up supply cards to charge the raw timber used in manufacture to the Framing shed.

Practically no stock of manufactured timber is kept on hand so there is no Work in Process at the end of the month. The small amount of items which are on hand are made from waste so they are ignored.

Some of the timber is treated. Where this is the case the timber card is

marked "Treated". As the treating is charged by the cubic foot the cubical contents for all timber treated must be calculated. The number of cubic feet is noted on another timber card with the working place and the card is priced at the current cost per cubic foot. The treating costs are watched and changed when necessary.

All the timber and the treating are charged on the timber cards to working faces at estimated costs. A tabulated list is run for the charges to working faces for labor, supplies, and timber. From the list a statement of Working Face Costs is made up. On this statement the timber is shown at estimated costs.

The figures in ink are put on by the cost department. The timber card is coded and priced. As it is marked Treated the cubical contents of the timber is marked in the column headed "price". The centre card is the card on which the treating is charged. In this case the treating is charged at ten cents per cubic foot.

The bottom card is the one made up by the Framing Shed foreman to charge the raw timber used in manufacture to the framing shed. Each day a card for the amount of each size and sort of timber used is made up. The rest was used for some other working face.

The charges for timber treating are accumulated until the end of each months so that only one card for each working face is used. The card is dated the last day of the month.

SPECIAL REPORTS

As all of the accounting information is transferred to punched tabulator cards it is possible to obtain any combination of costs desired. Some of the reports which are made up from tabulated lists under different headings are described briefly below.

Working Face Costs

This is a statement showing information concerning every working place in the mine. All the stoping is shown under the following headings:

1. Number of location
2. Type of stope
3. Tonnage
4. Labor Cost
5. Explosives Cost
6. Timber used (at estimated costs on timber cards)
7. Miscellaneous Supplies
8. Backfill (estimated-moving average last 6 months)
9. Steel
10. Cement
11. Total Cost
12. Cost per Ton
13. Average Cost per Ton

The Development working faces have feet advanced in the place of tonnage but have the same classification.

Comparative Drill Costs

This statement shows a complete record of each drill used and the costs for month and costs to date.

Production Costs

This is a supplement to Details of Production Cost and shows a more complete breakdown of items of cost. The supplies used are shown in detail. The cost per ton milled is shown for each item.

Cost per Bullion Dollar

This is a statement corresponding to "Cost per Dollar Sales" published by some companies. It shows the cost per dollar of produced bullion of Labor, Supplies, Power, W.C.B., Miscellaneous, Depreciation, and Taxes. It is not used for control purposes but is compiled for the Directors.

Analysis of Shop Orders

This statement shows the details of each shop order, the amount spent to date and the estimated cost.

Analysis of Special Orders

Same as Shop Orders.

Shifts and Average Wage per Shift

The title describes this statement. As each occupation has a code number the amounts paid and the hours for each occupation is compiled and made into a statement.

UNIT PRODUCTION COSTS AT DIFFERENT TONNAGES

The compilation and use of this statement corresponds to budgetary control in manufacturing.

This statement is made up each year at the end of the fiscal year. It is available for the shareholder's annual meeting and is used as a basis for planning operations for the ensuing year. In addition to the annual statement an additional statement may be required at any time if there is any change in labor or material costs or if unusual conditions are encountered in mining.

The actual compilation of this statement is almost identical to the compilation of a manufacturing budget. A schedule or several schedules is made up for each item of cost. Accompanying each schedule is a graph covering the range of tonnage. The engineering department is responsible for most of the schedules. A large part of the figures are based on past performance and some are based on an estimate but in all cases a complete file is kept so that any item may be checked. Each schedule is checked and rechecked several times before the statement is made up.

Milling and Refining is shown as one total on the statement but the supporting schedules for this figure are about equal to the rest of the schedules. Each milling account has a schedule and a graph and there is a schedule and a graph for the summary schedule which supplies the figures for the statement. The mill executive is responsible for the entire mill figures. They often call upon the cost department for special cost reports on past performance such as combinations of several operations.

The cost department is responsible only for the accuracy of the figures in the final statement but it co-operates closely with engineering on the entire compilation.

COST ACCOUNTING FOR THE MINING INDUSTRY

UNIT PRODUCTION COSTS AT DIFFERENT TONNAGES

DIRECT COSTS	500	750	1000	1250	Etc.
Development					
Labor					
Explosives					
Supplies					
Diamond Drilling					
Mining					
Backs and Stopes					
Labor					
Explosives					
Supplies					
Handling Backfill					
Tramming					
Pumping					
Crushing					
Hoisting					
Ventilation					
Underground Conveyor					
General Mine Expense					
Milling and Refining					
DISTRIBUTABLE EXPENSE					
Shops Maintenance					
Power					
Water					
Heating					
Handling Steel					
Craig Bits					
Drill Maintenance					
Supplies Handling					
Sampling					
Assaying					
Trucking					
Railway Siding					
Mucking Machine Mntce.					
Framing Shed					
Treating Timber					
Gas Shovel					
Tractor					
GENERAL CHARGES					
OTHER COSTS					
Marketing Bullion					
Head Office Expense					
Administration					
Depreciation					
Provision for Taxes					
TOTAL UNIT COST					
PRODUCTION					
NET PROFIT					

« STUDENT SECTION »

COST ACCOUNTING

Comments by A. Van Harris, C.A.

Problem 4—Advanced Cost Accounting, 1946.

Ashton Company Limited supplies small mechanical mowers at a price of $12,000 each. Based on past experience which is reviewed and adjusted monthly, if necessary, the Company's estimate of manufacturing cost per machine is:

Direct Material	$ 3,600
Direct Labour	5,400
Manufacturing Expense	2,400
	$11,400

On September 1st, the Company had three engines in process, each estimated to be 80% complete. During the month four new engines were commenced, five were completed and four delivered. Of those still in process at 30th September one is complete in respect to material and 60% complete for labour and manufacturing expense, and the other is 20% complete for all elements of cost.

Accounting records are maintained on an estimating cost system with 3 Work-in-Process Accounts in use.

During the month of September the actual transactions were as follows:

Material purchased	$26,400
Material requisitioned—	
Indirect	920
Direct	12,000
Direct Labour	19,200
Indirect Labour	1,920
Manufacturing Expenses, other	3,000

Prepare:

(1) Journal Entries to record transactions for the month of September including those to allocate the variances.

(2) Revised schedule of estimated costs.

SOLUTION

	Dr.	Cr.
Material Stores	26,400.	
Accounts Payable		26,400.
To record purchases		
Mfg. Expense in Process	920.	
Material in Process	12,000.	
Material Stores		12,920.
Actual Requisitions		
Mfg. Expense in Process	1,920.	

Labour in Process			19,200.	
Accrued Payroll				21,120.
Actual Payrolls				
Mfg. Expense in Process			3,000.	
Vouchers Payable				3,000.
Actual				
Finished Goods			57,000.	
Material in Process		(5 x 3600)		18,000.
Labour in Process		(5 x 5400)		27,000.
Mfg. Expense in Process		(5 x 2400)		12,000.
Estimated cost of 5 engines.				
Cost of Goods Sold			45,600.	
Finished Goods				45,600.
4 sold @ $11,400.				
Accounts Receivable			48,000.	
Sales				48,000.
Sales of 4 @ $12,000.				
Work in Process Inventory	No. 1	No. 2	10,560.	
Material in Process	3,600.	720.		4,320.
Labour in Process	3,240.	1,080.		4,320.
Mfg. Exp. in Process	1,440.	480.		1,920.
At Estimated Costs.				
Material in Process			1,680.	
Work in Process Inventory				325.
Finished Goods				271.
Cost of Goods Sold				1,084.
To allocate overabsorbed charge for material based on allocation of amounts—				
W-I-P Inv.	$4,320. = 19.35% = $ 325.			
Fin. Goods	3,600. = 16.13% = 271.			
Cost of Goods Sold	14,400. = 64.52% = 1,084.			
	$22,320.—100 % of $1,680.			

	Dr.	Cr.
Work in Process Inventories	116.	
Finished Goods	145.	
Cost of Goods Sold	579.	
Labour in Process		840.
To allocate unabsorbed charge for labour based on allocation of amounts		
Work in Process Inv. .... $ 4,320. = 13.79% = $116.		
Finished Goods ..... 5,400. = 17.24% = 145.		
Cost of Goods Sold .... 21,600. = 68.97% = 579.		
$31,320. 100 % — $840.		
Manufacturing Expense in Process	2,320.	
Work in Process Inventories		320.
Finished Goods		400.

Cost of Goods Sold		1,600.
To allocate overabsorbed charge for labour based on allocation of amounts		
Work in Process Inv. ..	1,920. = 13.79% =	$ 320.
Finished Goods	2,400. = 17.24% =	400.
Cost of Goods Sold	9,600. = 68.97% =	1,600.
	$13,920. 100. %	$2,320.

Revised Estimate of Costs

	Original Estimate	Adjustment	Revised Estimate
Material	3,600.	—271	3,329.
Labour	5,400.	+145	5,545.
Manufacturing Expense	2,400.	—400	2,000.
	11,400.	—526	10,874.

COMMENTS

There appears to be an alternative method of disposing of the under or over absorbed variances in a problem such as this.

The method developed here prorated the variances over the totals removed from the "in process" accounts during the period. The other method would be to prorate the variance over the amounts added in the current period—for example—Material was applied as follows:

		Division of Variances on this basis
Work in Process Inventory	$ 4,320.	$ 531.
Finished Goods	3,600.	442.
Cost of Goods Sold	5,760.	707.
	$13,680.	$1,680.

Similarily this method could be applied to the Labour and Manufacturing Expenses Variances. This would result in a revised estimate of costs as follows:

	Original Estimate	Adjustment	Revised Estimate
Material	3,600.	—442	3,158.
Labour	5,400.	+267	5,647.
Manufacturing Expense	2,400.	—682	1,718
	11,400.	—877	10,523.